



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,547	02/26/2004	Takayuki Iseki	21994-00067-US	3258

30678 7590 03/02/2006

CONNOLLY BOVE LODGE & HUTZ LLP
SUITE 800
1990 M STREET NW
WASHINGTON, DC 20036-3425

EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/786,547	Applicant(s) ISEKI, TAKAYUKI	
	Examiner Rodney G. McDonald	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 is/are allowed.
- 6) ☒ Claim(s) 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grunenfelder (U.S. Pat. 5,399,253) in view of Franks (GB 2241710), Kobayashi et al. (U.S. Pat. 5,439,574) and Yagi (Japan 04-371575).

Regarding claim 6, Grunenfelder teach in Fig. 2 a target 1 a cathode for holding the target 1, a permanent magnet located under the target 10, 11, the permanent magnet comprising a first permanent magnet 10 provided with a sliding mechanism for sliding the first permanent magnet 10 horizontally with respect to the target, being located in the middle of the target, a second magnet 11 located and fixed in peripheral

Art Unit: 1753

area of the target 1 and the polarity of the first magnet 10 and the second magnet 11 have opposite polarities. The top surfaces of the magnet are in parallel with one another. (See Fig. 2, 2a; Column 6 lines 18-45)

The differences between Grunenfelder et al. and the present claims is that a vacuum chamber is not discussed, a substrate is not discussed, an anode holding the substrate being located above the cathode to face the substrate toward the target on the cathode is not discussed, the field strength of the second magnet being weaker than the field strength of the first magnet is not discussed and the center magnet having a north pole facing the target and the peripheral magnet has a south pole facing the target.

Kobayashi et al. teach in Fig. 1 a vacuum chamber 1, a substrate 6 and a substrate holder 4. The substrate anode includes the substrate holder and the substrate. The substrate is located above the cathode 2. (See Fig. 1; Column 1 lines 17-45)

The motivation for providing a vacuum chamber, a substrate, an anode located above the target holding the substrate is that it allows for producing metallization schemes on substrates. (Column 1 lines 10-15)

Franks teach an unbalanced magnetron where the total strength of the peripheral magnets is greater than the strength of the magnet at the center. (See Page 4; Abstract)

The motivation for utilizing an unbalanced magnetron is that it allows for sputtering ferromagnetic targets. (See Abstract)

Yagi teach in Fig. 1 where the center magnet has a north pole facing the target and the outer peripheral magnet having a south pole facing the target. (See Fig. 1)

The motivation for utilizing a particular orientation of the magnets is that it allows for eroding the target. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Grunenfelder by utilizing a vacuum chamber, substrate and anode supporting the substrate above the target as taught by Kobayashi et al., to have utilized an unbalanced magnetron as taught by Franks and to have utilized a particular orientation of the magnets as taught by Yagi because it allows for producing metallization schemes on substrates and allows for sputtering a ferromagnetic targets.

Allowable Subject Matter

Claims 1-5 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 1, 2, 4 and 5 are allowable over the prior art of record because the prior art of record does not teach the claimed magnetron sputtering apparatus including a rotation controller rotating the permanent magnet assembly around an axis with rotation occurring on a center of the target as the axis, the permanent magnet assembly further comprising: a base; a first permanent magnet being fixed on the base in the middle; and a second permanent magnet in a ring shape being fixed in a peripheral area of the base so as to surround the first permanent magnet, wherein a magnetic polarity of the second

Art Unit: 1753

permanent magnet is inverse with respect to a magnetic polarity of the first permanent magnet, and wherein magnetic field strength of the second permanent magnet is weaker than magnetic field strength of the first permanent magnet, and wherein the permanent magnet assembly is formed such that a plane constituted by a top surface of the first permanent magnet and another top surface of the second permanent magnet is slanted with respect to a surface of the target.

Claim 3 is allowable over the prior art of record because the prior art of record does not teach the claimed magnetron sputter apparatus including a rotation controller rotating the permanent magnet assembly around an axis with rotation occurring on a center of the target as the axis, the permanent magnet assembly further comprising: a base; a first permanent magnet being fixed on a middle of the base wherein a center axis of the first permanent magnet is shifted eccentrically with respect to the center of rotation of the permanent magnet assembly; and a second permanent magnet in a ring shape being fixed in a peripheral area of the base so as to surround the first permanent magnet; wherein a magnetic polarity of the second permanent magnet is inverse with respect to a magnetic polarity of the first permanent magnet; and wherein magnetic field strength of the second permanent magnet is weaker than magnetic field strength of the first permanent magnet.

Response to Arguments

Applicant's arguments filed 12-28-05 have been fully considered but they are not persuasive.

In response to the argument that the configuration of Franks is different from the configuration utilized by applicant, it is argued that Grunenfelder et al. teach the magnet configuration and Franks suggest the strength of the magnetic poles. Thus the combined references teach the claimed subject matter. (See Franks and Grunenfelder discussed above)

In response to the argument that the location of the magnetic polarities is not taught by the prior art, it is argued that the newly cited reference to Yagi suggest the required magnetic polarity required by the claims. (See Yagi discussed above)

In response to the argument that the permanent magnet assembly claimed is different than the magnet assembly of Kobayashi, it is argued that Kobayashi was relied upon to teach features of the claims such as the vacuum chamber and anode and not the magnetic structure. The combination of references teach the magnetic structure. Grunenfelder teach first and second magnets with the horizontal moving first magnet.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

Art Unit: 1753

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
February 27, 2006